

# THE BULLETIN

Monthly News from ENERGY STAR Buildings<sup>SM</sup> and Green Lights<sup>®</sup>

September 1, 1999



## Web Site Information

ENERGY STAR Buildings<sup>SM</sup>  
and Green Lights<sup>®</sup>  
[www.epa.gov/buildings](http://www.epa.gov/buildings)

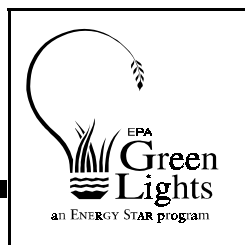
ENERGY STAR<sup>®</sup> Label  
for Buildings  
[www.epa.gov/buildinglabel](http://www.epa.gov/buildinglabel)

Ally Services and Products  
(ASAP) Directory  
[www.epa.gov/asap](http://www.epa.gov/asap)

## New Partners

**EPA would like to congratulate the following Partners who have recently joined ENERGY STAR Buildings**

BI LO, Inc.  
Case Western Reserve University  
City of Madison  
Consolidated Stores  
Covenant HealthCare  
Delaware River Basin Commission  
Haywood County Schools  
Hoyts Cinemas Corporation  
Kerr Drug Stores  
Keyport Board of Education  
Killington Ski Resort  
Landmark Inn  
Loma Linda University Medical Center  
McAlester Army Ammunition Plant



## Have You Checked Out Our Tools Lately?

As either a veteran or brand new participant in ENERGY STAR Buildings or Green Lights, no doubt you are familiar with the variety of helpful tools the Partnership offers to support your energy-efficiency efforts. The last few years, however, have marked an expansion in tools that represents both EPA's interest in finding new, innovative approaches to energy efficiency and customizing those approaches to the exact needs of its participants. Following is a quick overview of the Partnerships tools, including those that are tried and true as well as those that represent the new generation in program support.

### Technical Publications

ENERGY STAR Buildings and Green Lights provides its participants with access to a wide range of technical publications that cover topics such as energy strategies, new technologies and techniques, and financing and investment. These publications also include case studies that detail how others have implemented and benefitted from the Partnership.

*ENERGY STAR Buildings Manual* assists ENERGY STAR Buildings Partners in planning and implementing a profitable energy strategy. Chapters covering the five stages of the ENERGY STAR Buildings upgrade approach have been recently revised. Also, a revised version of the printed ENERGY STAR Buildings Manual is available.

*Lighting Upgrade Manual* provides comprehensive information on implementing, planning, financing,

disposing of lighting waste, communicating success, and learning about new technologies and strategies for upgrading the lighting systems in buildings.

### New Technologies and Techniques

- ☆ "Revitalizing Lighting Maintenance, A Special Report" in *Maintenance Solutions* magazine.
  - ☆ "The New Economics of Lighting Retrofits" on utility deregulation published in *Buildings Operating Management* magazine.
  - ☆ "Preparing for Performance Contracts" on performance contracting.
  - ☆ "Lighting Upgrade Technologies" providing updated information about state-of-the-art lighting components and controls.
  - ☆ "Lighting Waste Disposal" addressing the economic and regulatory concerns of disposal of PDC-containing ballasts and mercury-containing lamps.
  - ☆ "Lighting Maintenance" explaining how to implement a lighting maintenance program in order to save money and improve lighting system efficiency.
  - ☆ "Lighting Evaluations" evaluating the illumination, energy efficiency, and user acceptance of lighting systems and controls.
- ### Financing and Investment Guides
- ☆ "Introducing Your Company's Newest Profit Center" presenting energy efficiency as a business investment.
  - ☆ "Business Analysis for Energy-Efficiency Investments" explaining how to analyze energy-efficiency projects as investments.

## **New Partners, Cont'd**

Muskogee Regional Medical Center  
 New Braunfels Independent School District  
 Riverdale Mills Corporation  
 Saint Agnes of Baltimore  
 Salt Lake City, Dept. of Community and Economic Development  
 Upper Moreland School District  
 Wachovia Corporation

## **New Allies**

### **EPA would like to congratulate the following Allies who have recently joined ENERGY STAR Buildings**

2RW Consulting Engineers  
 ABB Energy Capital  
 Academic Capital, LLC  
 Advanced Energy, Management of New England, LLC  
 Advanced Thermal Technologies  
 American Lighting and Supply Incorporated  
 Middleburg  
 American Scientific Lighting  
 Applied Lighting, Inc.  
 Automated Logic Corporation  
 Avista Utilities  
 California Utility Buyers JPA  
 Colonial Energy  
 CommAir Mechanical Services  
 Coolco Corporation  
 Creative Lighting Management Services  
 Dual Temp Company  
 Duprey Environmental  
 Eastern Fixture Company  
 Eclipse Technologies  
 Eco Engineering  
 Einhorn Yaffee Prescott  
 ELECTRO-SPEC

- ☆ "Financing Your Energy Efficiency Upgrades" reviewing options for financing efficiency projects.

### **Technical Case Studies**

- ☆ Mobil Corporation, Reston, Virginia.
- ☆ Mobil Corporation, Dallas, Texas.
- ☆ City of Sierra Vista, Arizona.
- ☆ "Green Lights Application Profiles" highlighting various lighting applications that include case studies of specific Green Lights Partners. Topics include daylight switching; high-intensity discharge (HID) bi-level switching; occupancy sensors for educational, industrial and commercial office spaces; daylight dimming; LED traffic lights; timer switches; and scheduling controls.

### **NEW Technical Publications**

- ☆ *The Ally Services and Products (ASAP) Directory*, an indexed electronic directory of ENERGY STAR Buildings Allies, is a new tool that was developed to allow users to quickly identify companies that provide specific products or services for improving the energy efficiency in buildings. The ASAP Directory also serves as a source of information for the energy-efficiency industry, providing detailed case studies of energy-efficiency projects, monthly series of energy-saving tips and helpful environmental information, and how much pollution the ENERGY STAR Buildings Partnership has been able to prevent. To access the ASAP Directory visit the ASAP Directory Web site at [www.epa.gov/asap](http://www.epa.gov/asap).
- ☆ *E Source Technology Atlas Series*. This Series is a five-volume compendium of energy-efficiency products and practices, in both print version and CD-ROM, that complements the ENERGY STAR Buildings Upgrade Manual. Each volume—Lighting, Heating, Cooling, Drivepower, and Appliances—provides the latest objective information on products and applications; product comparisons, including charts and tables to simplify product selection and design

choices; integrated design approaches, stressing the opportunities inherent to a whole-system approach; and case studies, highlighting the real-world experiences of designers and building managers with energy-efficient technologies and strategies. In addition, the E Source Series provides detailed personal and technical references to help Partners make the educated choices necessary for a successful energy-efficiency upgrade. To access the E Source Technology Atlas Series visit the E Source Web site at [www.esource.com/atlas](http://www.esource.com/atlas).

To order any of the above publications, call the toll-free ENERGY STAR® Hotline at 1-888-STAR YES (1-888-782-7937).

### **Technical Support Software**

The Partnership offers several software tools to assist participants in planning, managing, tracking, and reporting energy efficiency upgrades in their facilities. The number and variety of software tools also has expanded to include new applications. Below is a comprehensive list of both old and new software tools available.

*QuikPlan* is a comprehensive software tool to assist ENERGY STAR Buildings Partners with planning, managing, tracking, and reporting building upgrades. It enables users to analyze the benefits of energy-efficiency upgrades among several facilities, and to compare the energy performance of those buildings with similar buildings in the same climate zone. Users construct a database of facility utility data and upgrade costs, choose actions for each facility, and view long-term financial and energy effects. QuikPlan offers a quick and simple method to organize multiple projects and track aggregate upgrade benefits. It also produces reports for fulfillment of the ENERGY STAR Buildings reporting commitment. The latest version, QuikPlan.0, includes several improvements. It is now easier to select the best building for upgrades by

## **New Allies, Cont'd**

Energy Consultants of South  
 West Florida  
 Environmental Support  
 Solutions  
 FaciliTech Systems, Inc.  
 Falvey Energy Engineering  
 Fencon Corporation  
 Gainesville Regional Utilities  
 Gateway Lighting and Energy  
 Hallmark Air Conditioning,  
 Inc.  
 Harmonics Limited  
 HEC, Inc.  
 Hi-Lites of Tennessee, LLC  
 Holaday Parks Incorporated  
 HPS Plumbing  
 Illinova Energy Partners  
 Innovative Lighting Services  
 Joseph E. Biben Sales  
 Company  
 KeySpan Energy  
 Lepore Engineering  
 Light Bulb Supply Company  
 Macurco Inc.  
 One Energy Services  
 OT Hall & Son, Inc.  
 PenTech Energy Solutions  
 Phoenix Electric Company  
 Professional Lighting &  
 Supply  
 Pro-Temp Controls  
 Sun Star Skylights  
 Superior Manufacturing  
 Division/Magnatech Corp.  
 The MC Alliance Group  
 Tolin Mechanical Systems  
 Company, Inc.  
 Trinity Contractors, Inc.  
 Triumphe Leasing Network,  
 Inc.  
 United Energy Partners  
 Utility Watchdog  
 Utopia Energy  
 Westar Energy Services  
 Willis Heating & Air  
 Conditioning  
 WLC Consulting  
 York International Corporation

comparing them to your other buildings and to typical buildings of the same type and climate zone. QuikPlan 2.0 also enables ENERGY STAR Building Allies to track and report progress for multiple Partners.

*ProjectKalc* offers a comprehensive energy and economic analysis of lighting upgrades, including equipment costs, labor time, and performance criteria inputs, and covers everything from relamping and delamping to controls and tandem wiring. It also includes user-modifiable databases of costs, labor time, and performance for more than 8000 common hardware applications. ProjectKalc also has been upgraded by way of a ProjectKalc Version 3.02 Upgrade Patch. The upgrade patch is a single file that you simply copy to the directory containing ProjectKalc and run to upgrade your installation of ProjectKalc while preserving any data that you have entered.

*QuikChill* enables users to assess potential chiller plant upgrades with economic and energy analysis. QuikChill will perform full economic and energy analysis of potential upgrade scenarios involving complex chiller plants without complex building data. QuikChill handles consolidation of existing chillers, integration of new chillers, and retrofits to existing chillers. It is an excellent tool for Partners facing CFE phaseout issues.

*QuikFan* is an easy-to-use analysis tool that assesses the cost-effectiveness of upgrading variable air volume (VAV) systems. It provides screening-level analysis without complex building data. The primary focus of the software is the application of variable speed drives (VSD) to fan motors. QuikFan also has options for high-efficiency motor installation and static pressure reset.

*QuikScope* provides property management firms and real estate owners

with a powerful financial analysis tool that estimates the economic viability of energy-efficiency upgrades based on a building's tenant mix and energy performance. QuikScope uses "what if" scenarios to show you which properties hold the greatest potential for increasing net operating income (NOI). For each property in your portfolio, QuikScope allocates the costs and benefits of energy-efficiency upgrades between owners and tenants, calculates how cost-recovery strategies can leverage energy savings into higher NOI and asset value, shows how lower operating costs can reduce vacancy and/or increase rents, and demonstrates how the timing and financing of energy-efficiency improvements can affect project viability.

*Refrigerator Analysis (ERA) Program* enables a comparison of the energy-efficiency potential of alternate household refrigerator designs.

All of these software tools are available on the ENERGY STAR Buildings Web site at [www.epa.gov/buildings](http://www.epa.gov/buildings) or by contacting the ENERGY STAR® Hotline at 1-888-STAR YES (1-888-782-7937).

## **The ENERGY STAR Label for Buildings and Labeling Tools**

The latest and most innovative tool the ENERGY STAR Buildings and Green Lights Program now offers is the ENERGY STAR Label for buildings accompanied by the Benchmarking Tool and the Statement of Energy Performance. If you want to measure and assess the energy performance of your building, these tools will help you do just that.

*The Benchmarking Tool* analyzes data that you enter about your building and provides you with a 0 to 100 score that tells you how well your building's energy performance compares with that of all similar-use buildings in the United States. The Benchmarking Tool normalizes

## Fan System Check List

The following list of questions will help you determine if your fan systems are good candidates for efficiency improvements:

- ☆ Is your air-handling system a constant volume system (a reheat, dual duct, or multizone system) or a variable air volume (VAV) system?
- ☆ Have you assessed your fan system to determine if it is oversized?
- ☆ Do your fans have variable-speed drives (VSD) or mechanical volume control devices that allow the motor speed to vary depending upon actual operating load requirements?
- ☆ Is your fan system set at optimum start and stop times and adjusted with seasonal changes?
- ☆ Have you reset the pressure for any existing VSDs?
- ☆ After achieving the load reductions accomplished in Stages One through Three, have you considered installing smaller, more efficient motors that better match the new, reduced load requirements?
- ☆ Is your fan system regularly maintained, including the cleaning or replacement of filters, the replacement of worn drive belts, and the checking of alignment of pulley faces and drive shafts?

weather and other factors, providing an assessment that takes into account those impacts beyond your control.

*The Statement of Energy Performance* is standardized documentation that captures the results from your use of the Benchmarking Tool. The Statement presents your building's annual energy use by energy source, its benchmarking score, and the ENERGY STAR Target (a rating of 75), and its status against four indoor environment criteria. And it tells you if your building qualifies for the Label. The Statement provides an easy-to-understand energy performance report for use in business transactions, and its submission is required to apply for the Label.

*The ENERGY STAR Label for Buildings.* If your building scores 75 or better on the Benchmarking Tool and it meets indoor environment criteria, it qualifies for the ENERGY STAR Label for Buildings. With the Label, your building receives a plaque from EPA that identifies your energy-efficiency successes and enables your building to be recognized for energy-efficiency leadership.

## ENERGY STAR Buildings Stage Four: Fan Systems Upgrades

Many U.S. buildings have over-sized, inefficient fan systems. In fact, according to an EPA study, as many as 60 percent of systems are oversized by 10 percent or greater, and the average system is oversized by 38 percent.<sup>1</sup> Under some conditions, oversized fans can deliver too much air to the spaces being heated or cooled, resulting in wide temperature fluctuations. These lead to increased occupant complaints, excess energy use, and increased energy and maintenance costs. The ENERGY STAR Buildings Partnership addresses these inefficiencies

and occupant comfort issues in Stage Four: Fan Systems Upgrades.

## ENERGY STAR Buildings Strategic Approach

The ENERGY STAR Buildings strategic approach is comprised of five stages, each corresponding with a particular set of building systems and a set of strategies to increase system efficiencies. This strategy is built around how heat is generated in buildings and how energy systems deal with heat as they maintain building air temperatures at desired levels. The strategy is sometimes illustrated as a pyramid called the "heat triangle". This triangle illustrates energy flows through a building. The lowest tier consists of building systems where heat is gained from lighting and internal office equipment, or through the building envelope (windows, doors, etc) and HVAC systems (outside air dampers). These are the first areas addressed by the ENERGY STAR Buildings approach. The middle tier consists of air and water distribution systems (fans and pumps) that supply heat or cool generated by the central plant (upper tier) to the lower tier (building loads). The top tier represents central plant equipment (such as chillers and boilers), where operating efficiencies can be improved after reducing building loads and downsizing air distribution systems.

## Fan Systems

Fans and the motors that drive them are the central components of a building's air distribution system. Fans distribute heated and cooled air throughout a building and provide fresh air for ventilation. Air is pumped through ductwork to the end-use spaces and also re-circulates back to the source through return air ducts.

## **Ask the Energy Expert**

### **Have a Question?**

Get your maintenance, financing, communications, and Partnership questions answered by e-mailing Sol Salinas, *Bulletin* Editor, at [salinas.sol@epamail.epa.gov](mailto:salinas.sol@epamail.epa.gov). Answers to technical questions and other technical tips are also available on the Ally Services and Products (ASAP) Directory on the Web at: [www.epa.gov/asap](http://www.epa.gov/asap).

### **Bulletin Subscription Information**

*The Bulletin* is distributed on the first Monday of the month to more than 6,000 ENERGY STAR Buildings and Green Lights participants and friends.

To add or remove your name from the fax distribution list, please call the toll-free Hotline at: **1-888-STAR YES**.

To receive *The Bulletin* electronically, please send an e-mail to: "listserver@unixmail.rtpnc.epa.gov" and in the message body type in the following:

subscribe energystar your name

You also can remove your name by typing:

unsubscribe energystar

If you have questions, you may e-mail Sol Salinas, *Bulletin* Editor, at:

[salinas.sol@epamail.epa.gov](mailto:salinas.sol@epamail.epa.gov)  
or call the toll-free Hotline.

### **Stage Four: Fan Systems Upgrades**

To maximize the results of fan systems upgrades, it is important to maximize the depth of upgrades in the first three stages: Stage One - Green Lights, Stage Two - Building Tune-up (controls & envelope) and Stage Three - Other Load Reductions. After realizing load reductions achieved in the first three stages, efficiency improvements can be made in fan systems resulting in energy savings and cost reductions. Identifying potential improvements is crucial to developing a fan-systems investment plan and ultimately achieving savings. Such improvements include:

- ☆ Evaluating fan and motor-size requirements and efficiencies.
- ☆ Installing re-sized fans and higher-efficiency motors.
- ☆ Utilizing variable speed/frequency drive (VS/FD) technologies on existing motors.
- ☆ Revising ventilation control strategies.
- ☆ Improving system efficiencies by converting from constant- to variable air-volume operation.
- ☆ Implementing newer technologies, such as:
  - Variable Speed / Frequency Drives,
  - Economizer controls, and
  - Energy-efficient motors and belts.

Significant savings can be gained in this stage by reducing the size of the fans and their motors, increasing motor efficiency, and installing properly sized VS/FDs. The advantage of investing in new higher-efficiency motors and drives at this stage is that reduced building loads in ENERGY STAR stages 1-3 enable the building owner to use smaller, less expensive equipment. Converting from constant volume (CV) to variable air-volume (VAV) systems also will improve fan

systems because VAV systems deliver desired air temperatures and volumes more efficiently than CV systems. Although VAV systems are more efficient than CV systems, opportunities still exist to improve the efficiency of many VAV systems. Improvement potential depends upon load reductions gained in the first three stages and the mechanisms by which system air volume is modulated under these new load parameters. The efficiency of VAV systems can be upgraded if the existing system uses mechanical air volume control devices such as inlet guide vanes, vortex dampers, and dump dampers.

The potential savings in this stage range from 50 to 85 percent, depending upon the extent of the load reductions achieved in stages 1-3 and the types of fan-system improvement measures implemented.<sup>2</sup> A further payoff is that energy and demand reductions reduce electricity use, which ultimately reduces CO<sub>2</sub> air emissions associated with the kilowatt-hours that were not used.

A survey and evaluation of all existing fan systems within your buildings can help identify potential system improvements. A comprehensive fan-systems evaluation can be found in the ENERGY STAR Buildings Upgrade Manual at EPA's Internet site: <http://inotes.icfkaiser.com/epa/estar/esbhome/buildingsmanual.html>. The data collected from the survey can be used in a software analysis tool, Quikfan, to evaluate variable speed drive and fan downsizing options and economics. See the "Tools" article for information on Quikfan as well as the EPA's Ally Services and Products (ASAP) directory if your organization does not have the resources or expertise in-house to conduct such a survey.

<sup>1</sup> VAV Systems: Maximize Energy Efficiency & Profits, EPA 430-R-95-002, p. 45.

<sup>2</sup> VAV Systems: Maximize Energy Efficiency & Profits, EPA 430-R-95-002, p. 9.